674.8

BULLETIN 521

Strength

A Light Weight

Durability

MET-L-WOOD CORPORATION

6755 West 65th Street

Chicago 38, Illinois

What MET-L-WOOD Can Do for You

HE STRENGTH and durability of metal, the light weight, rigidity and workability of wood—all are combined in Met-L-Wood. This unique structural material is made up of thin layers of both metal and wood, permanently bonded together. So thorough and positive is the bond that the metal and wood become as one. These strong, light sheets are easy to handle, can be assembled and fabricated with ordinary wood- or metal-working tools.

Used in doors and panels, Met-L-Wood

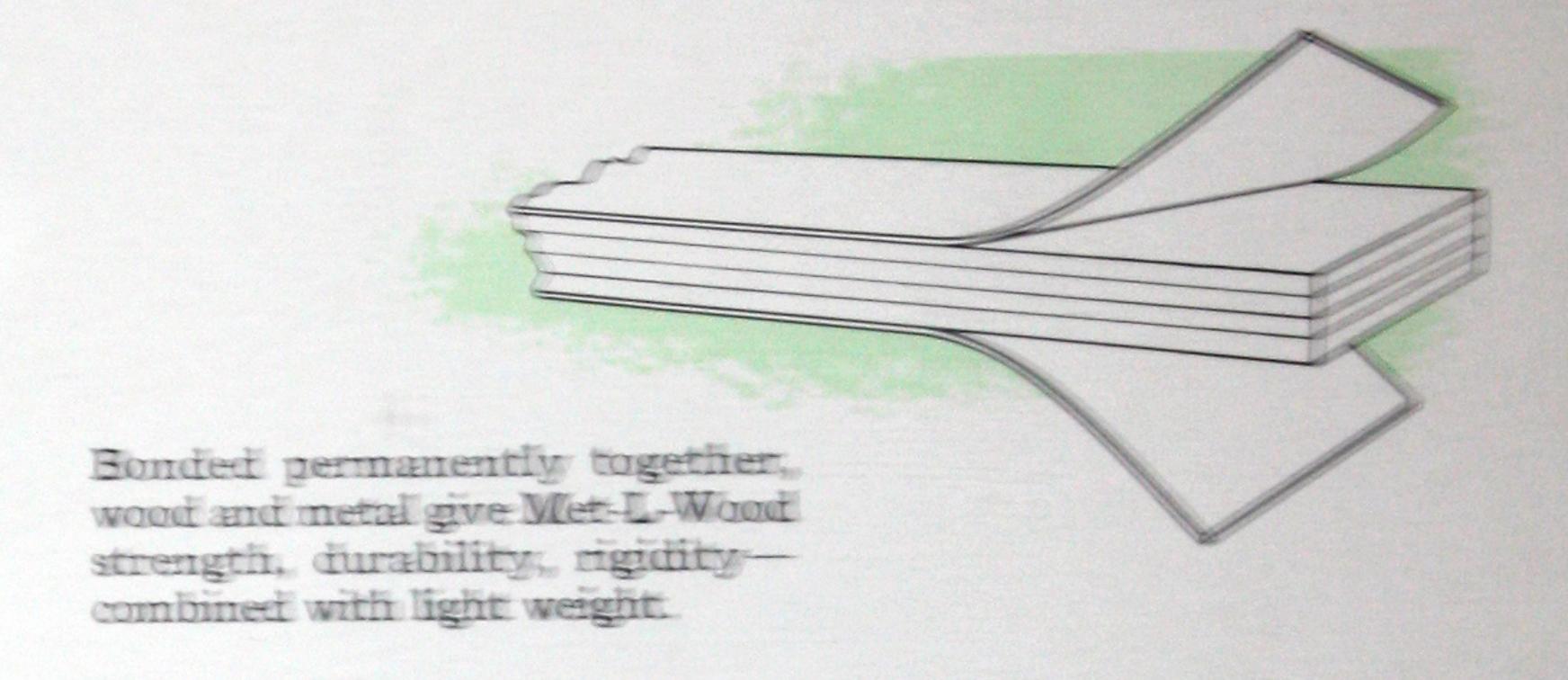
gives strength and long life, reduces maintenance and repairs. Walls, sheathing, counters, cabinets, table tops, equipment housing—in all its limitless applications Met-L-Wood provides great strength with much less weight than is found in other types of construction. Nor does Met-L-Wood require extensive ribs, frames or beams. Vibrations are damped and sound is reduced. Appearance is improved, for the smooth, clean surfaces of Met-L-Wood can be left unbroken by fastener heads.

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THIS IS MET-L-WOOD How it is made

Met-L-Wood is described by its name: metal and plywood (or processed board) bonded together permanently—under pressure—without mechanical fastenings of any kind. Depending on the intended use, many different metals can be used on one or both surfaces of Met-L-Wood (or as the core, when the Met-L-Wood is used on X-ray rooms). Edges of panels can be mechanically sealed to become absolutely air- and water-tight.



TYPES OF MET-L-WOOD

To Fit Your Needs Met-L-Wood is manufactured, for stock and general use, in sheet form in sizes up to 48" by 144". Total thicknesses range from 1/9" up to 11/2", or more, as required.

To meet specific needs, Met-L-Wood is produced in prefabricated form. Unusual sizes and thicknesses can be supplied. Specifications and plans can be fullowed to close tolerances, so that Met-L-Wood can be delivered to you ready for assembly.



Channel Bonding is done on this press-developed by Mer-L-Wood engineers to produce Channel Bond edges, as described on page 7.

CONSTRUCTION DETAILS

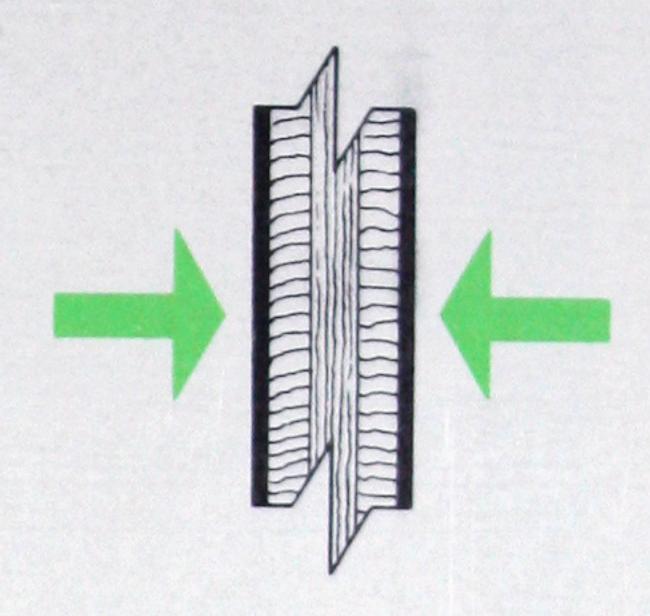
MET-L-WOOD Compared with other Structural Materials

Among the many advantages of Met-L-Wood are its high rigidity and light weight. Drawings at right illustrate its comparative stiffness, and the table below compares its weight with those of other materials.

WEIGHT

One Square Foot of	Weighs
2P2 MET-L-WOOD (3/8")	3.3 lbs.
SOLID OAK (11/16")	2.8 lbs. (but is nearly twice as thick)
ALUMINUM PLATE (3/8")	5.4 lbs.—64% heavier
STEEL PLATE (1/4")	10 lbs.—203% heavier

STIFFNESS

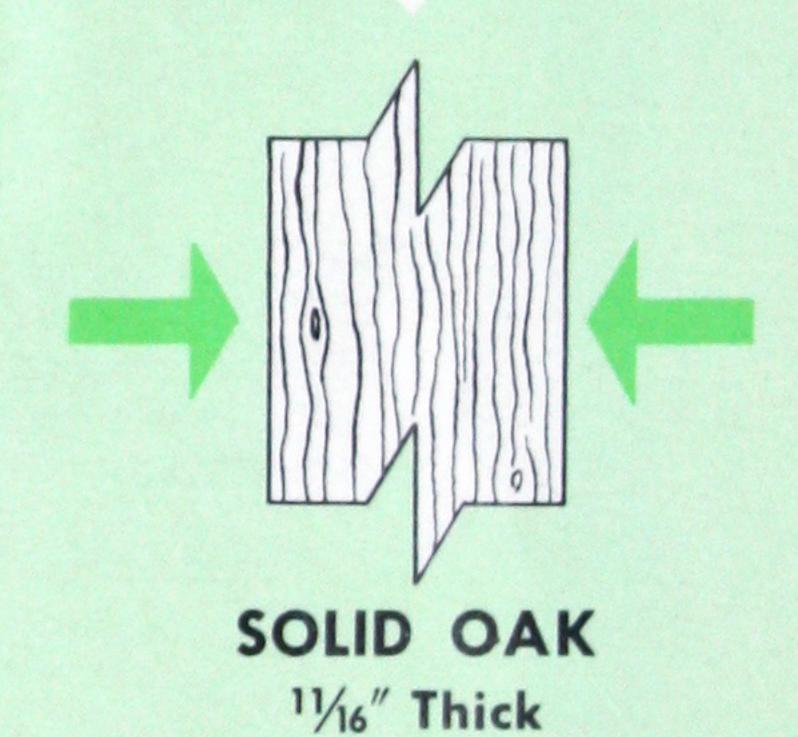


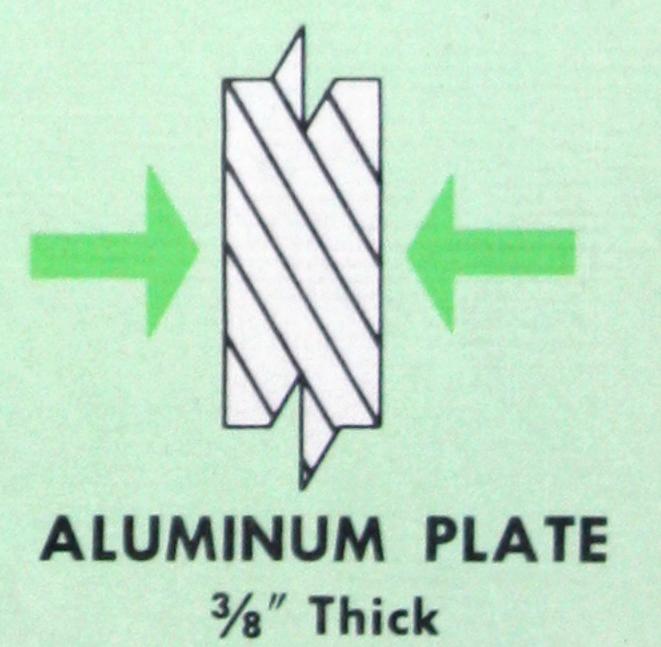
2P2 MET-L-WOOD

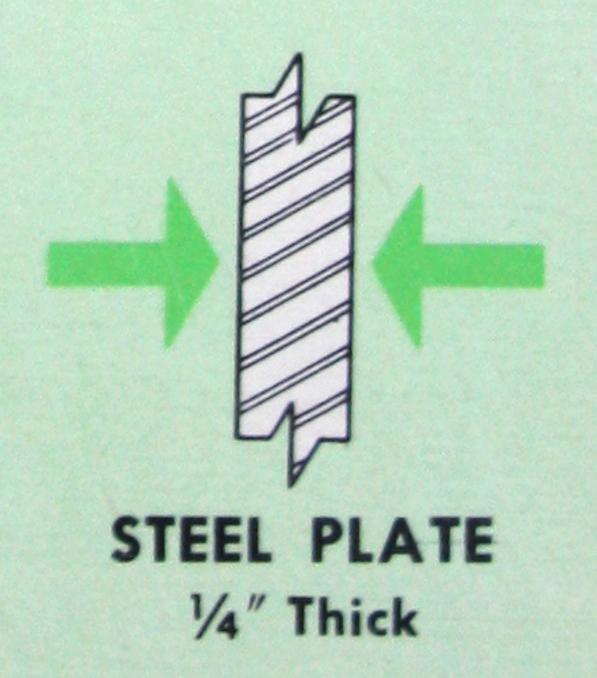
3/8" Thick

(Poplar or gum plywood with face and back of zinc-coated steel)

Has a stiffness factor equal to

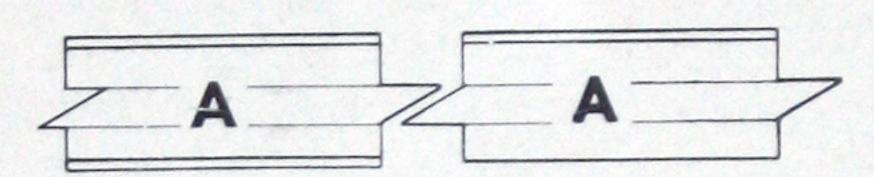




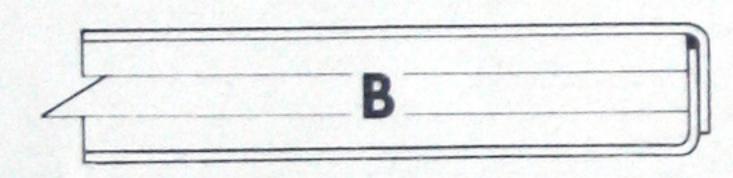


MET-L-WOOD Edges

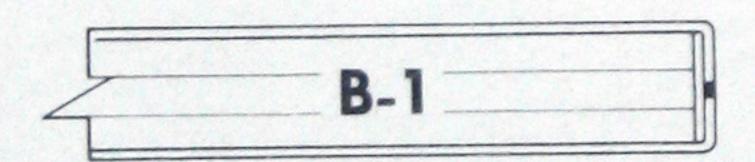
Met-L-Wood panels are supplied with plain saw cut edges unless ordered otherwise. Specially formed edges give greater edge strength, can be sealed tight against weather and moisture. Also, they simplify assembly of the panels. The most commonly used, specially formed Met-L-Wood edges, as well as the plain saw-cut edge, are illustrated and described on this page.



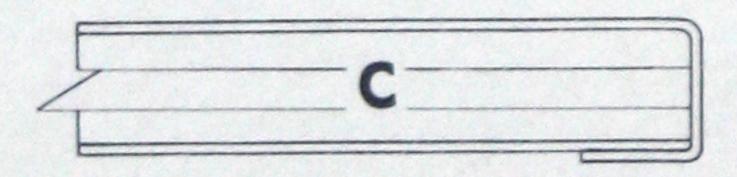
Plain saw cut. Edge should be subjected to only limited wear, impact, and free moisture unless it is protected further.



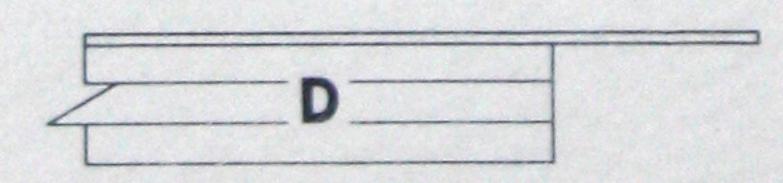
Forms a good moisture seal when soldered (aluminum cannot be soldered). Withstands light wear and impact.



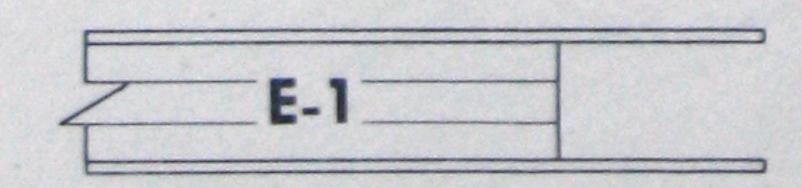
Variation of B edge.



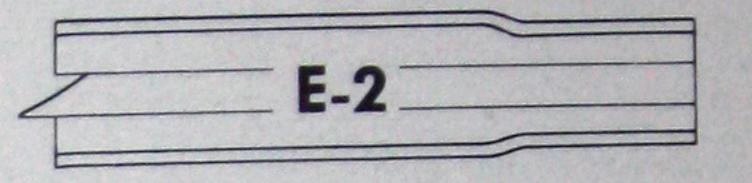
Similar to B. Has better appearance and slightly more resistance to impact. Used principally for table tops and counters.



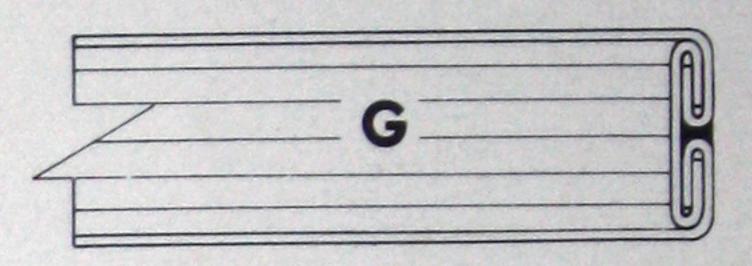
Flange supplied in length desired. Inside edge is plain saw cut.



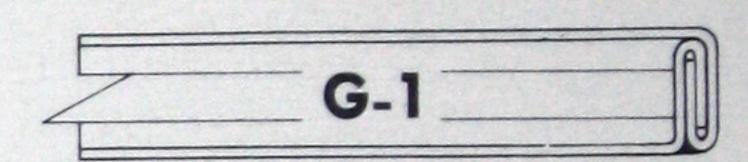
Often used in conjunction with E-2 to join panels.



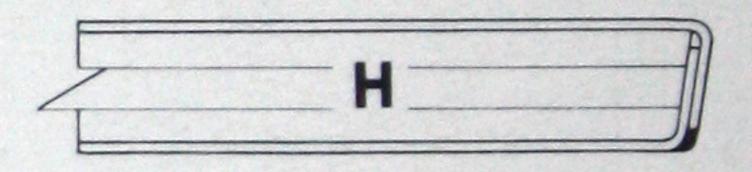
See E-1. Also used with channel edge to give one plane to both panel surface and channel flange.



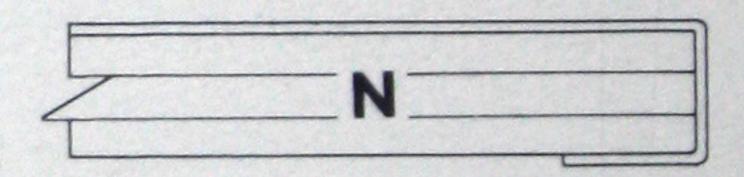
Seals well against free moisture when soldered. High resistance to impact and wear. For panels over \(\frac{1}{2}''\) thick. Standard edge for hinged doors.



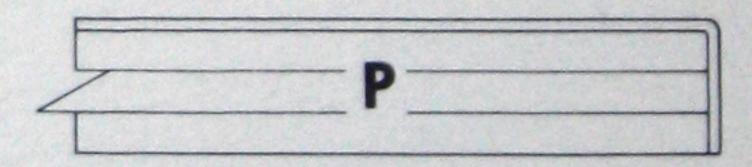
Similar to G. Standard edge for locomotive side panels and similar applications.



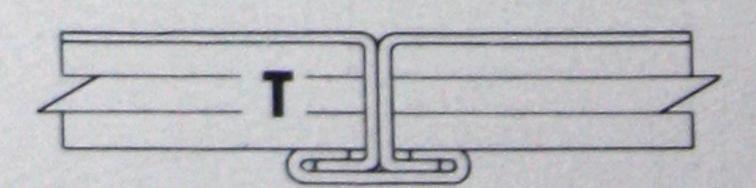
Same as B, except for angle of edge.



Smooth, clean edge finish for panels with metal on one side only.



Similar to N, but a lower-cost edge for panels with metal on one side only.



Sealed joints of two edges; watertight when soldered. For lining and exterior roofs of truck bodies and similar applications.

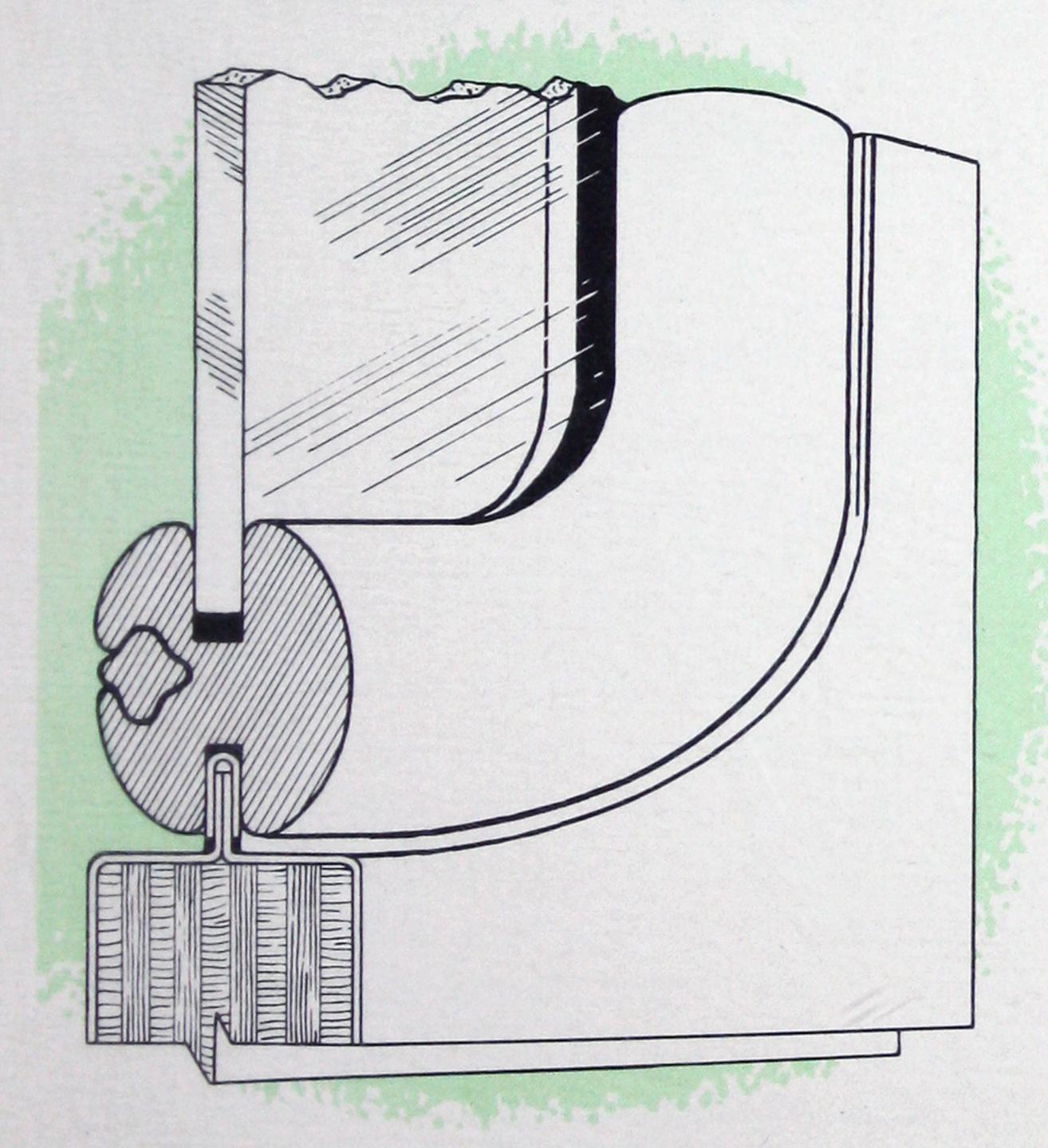
Note: See opposite page for Channel Bond and L-edge types.

Openings in MET-L-WOOD

When openings in Met-L-Wood panels and doors are called for, the panels and doors can be supplied with watertight edged openings, for use with (or without) the Met-L-Wood all-rubber stationary window sash, described below.

Wherever piping, beams or conduit must pass through Met-L-Wood, openings that are fitted and sealed can be provided to your specifications. Seals between Met-L-Wood and the piping can be accomplished with formed gaskets or packing.

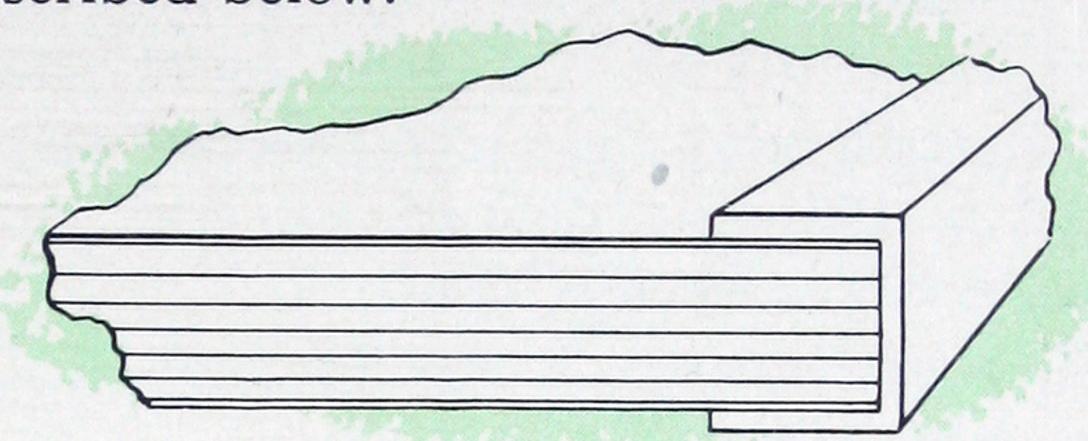
EXCLUSIVE MET-L-WOOD ALL-RUBBER "ZIPPER" WINDOW SASH



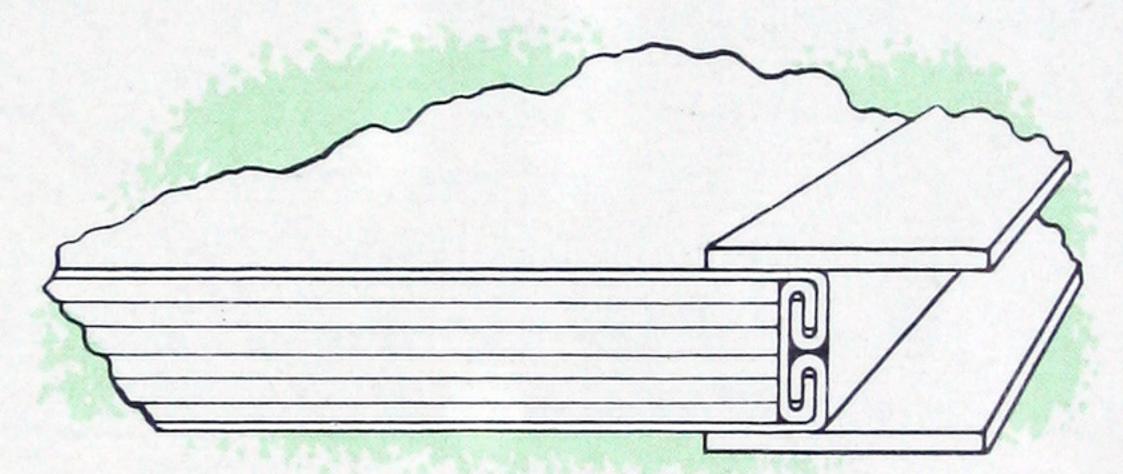
A drawing of the Met-L-Wood all-rubber stationary window sash appears above. For installation, the rubber sash (without the "zipper" strip) is slipped onto the edges of the glass. Both are then set into the window space, over the flange on the "L" edge of the opening. The "zipper" strip is inserted, and this tightens the rubber sash over both glass and flange. The resulting seal is watertight, vibration-proof, and has high push-out resistance.



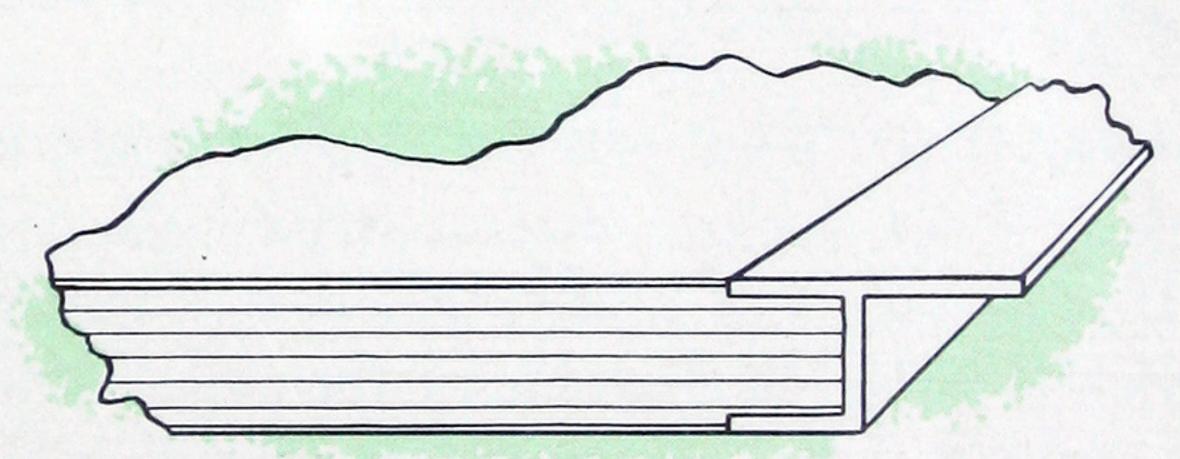
Channel Bond is an exclusive Met-L-Wood process which entirely eliminates the use of bolts, rivets or screw fastenings in attaching metal channels or strips to edges of Met-L-Wood sections. This high temperature bonding technique assures an absolutely water-tight, permanent connection between the two surfaces; gives a clean, unbroken surface along panel edges. Typical applications of the Channel Bond Process are illustrated and described below.



Channel for reinforcement of edges on doors and panels.

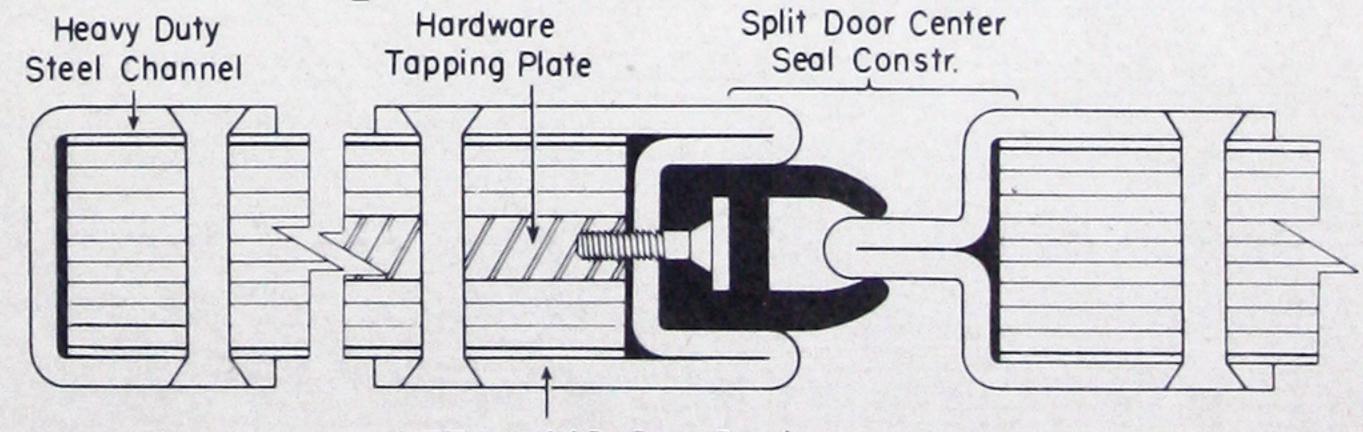


Bands for door trim strips, panel joints, or similar uses.



Channel for use on edges wherever flush surfaces are required on doors or panels.

Split Door Seal



MET-L-WOOD Door Panel

The patented Met-L-Wood Split Door Seal assures draft-free water-tightness on baggage and postal car doors, withstands years of continual use. Double flange rubber strip on one door receives metal flange of mating door so that the lips of the receiving strip are pressed tightly against the sides of the metal flange.

HOW TO FABRICATE AND

MET-L-WOOD PANELS can be fabricated easily with standard tools. As a general rule, when choosing the correct tool for cutting Met-L-Wood, the tool appropriate for use on the facing material of the panel will do the best job. Specific recommendations for various phases of Met-L-Wood fabrication are given below.

Sawing

Excellent results will be obtained by using a hardened, 10-tooth, $\frac{5}{8}''$ by 20 gauge, wavy set, metal cutting bandsaw blade operating at 3000 r.p.m. Fair results can be obtained by using standard wood working tools on aluminum, copper, lead, or similar soft metals on Met-L-Wood panels. Jig saws, hand power saws or hack saws having hard-edge metal-cutting blades can be used for odd shape cutting or for openings.

Panels with metal on one side only should be cut with metal side up.

Drilling and Boring

Ordinary carbon steel twist drills can be used for drilling Met-L-Wood. However, for repetitious operations of this kind, "Hi-speed" bits are recommended for longer wear and cleaner cutting. Conventional extension cutters or metal-cutting hole saws can be used for holes of larger diameter.

Notching—for corners & angles

Seamless corners and angles can be easily produced in panels of Met-L-Wood. An angular notch is made on one side of the panel down to the metal on the other side. Bending the panel to close the notch leaves a clean, seamless angle or corner.

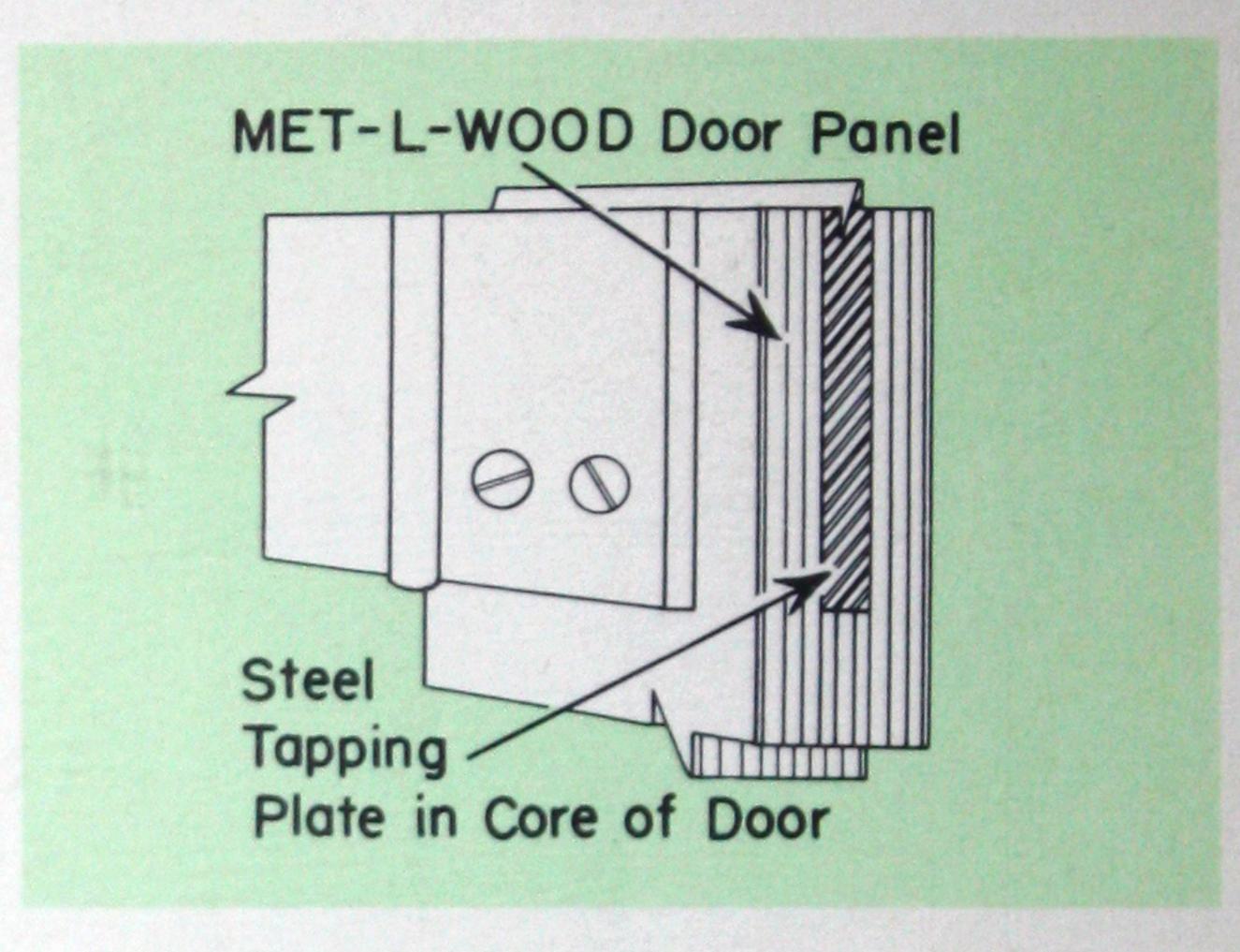
Soldering

Soldering is basic in the sealing of edges of Met-L-Wood panels. It can be done on all panels except aluminum-faced. Gas-furnace-heated soldering coppers of the 8 lb. hatchet type (2 coppers per set—4 lbs. each) are most practical. Comparable electric irons are also used. Acid base flux should be used, then neutralized after soldering. Torch soldering should be avoided as the excessive heat will char the wood core. Cold soldering processes have also been used with varying degrees of success.

Routing and Shaping

Panels faced with aluminum, copper, and soft brass can be cut to size or shape with highspeed single-edge bits. Carbide tip bits are preferred because of their longevity.

Shapers with grooving cutters can be used for removing the wood portion of the panels in performing certain steps in fabrication of edges. Care should be exercised in the set up of this operation to prevent burning of the metal faces through contact with the cutter.



Tapping Plates

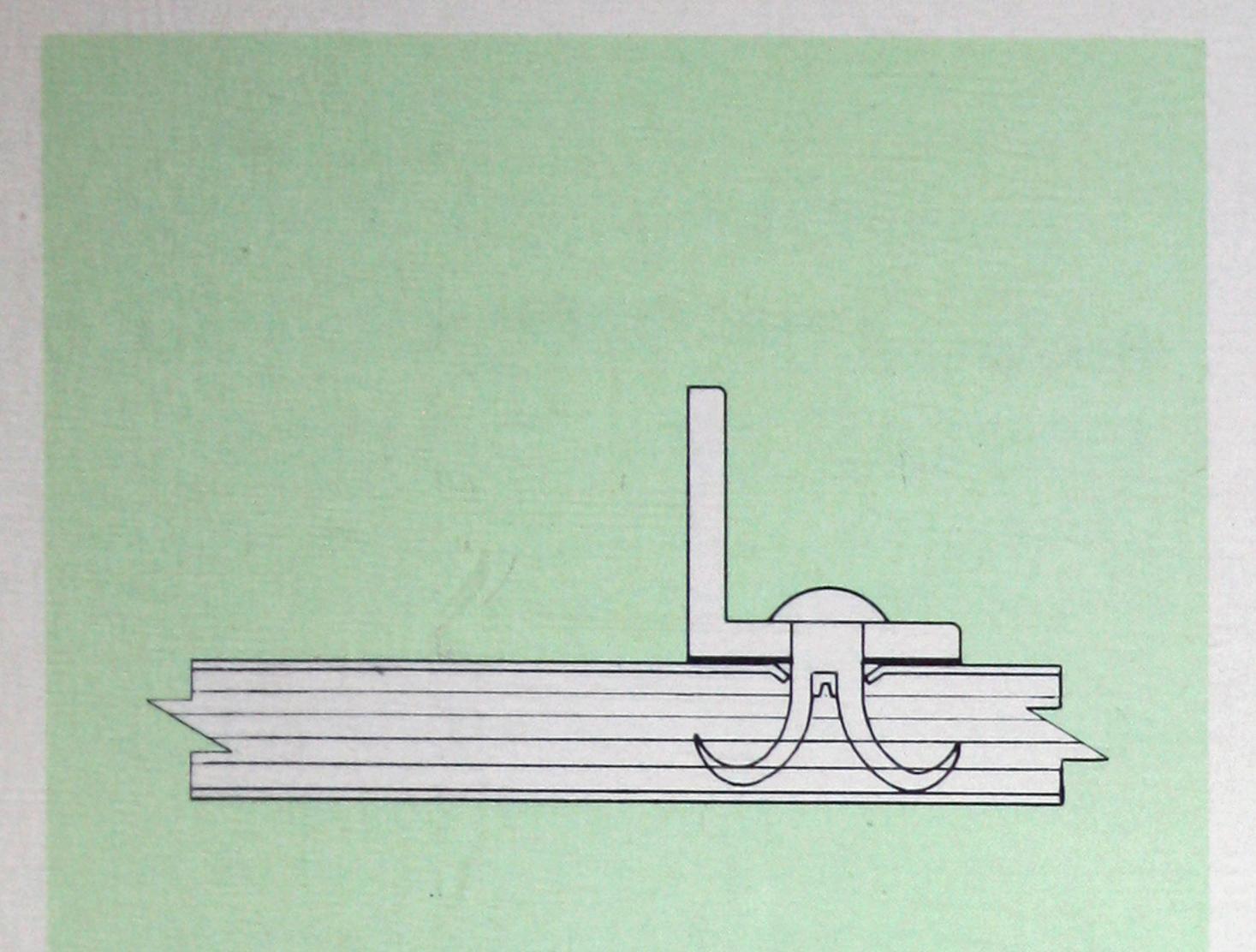
To insure maximum strength and service-ability when hinges and other hardware are fastened to Met-L-Wood doors and panels, steel plates are embedded in the plywood core at points where fastenings are to be made. These tapping plates become an integral part of the door or panel—invisible sections of added strength helping to create the remarkable service record of Met-L-Wood.

On doors delivered completely assembled, hardware is fastened to the doors at the factory. When on-the-job assembly is wanted, tapping plates are inserted to your specifications. Shown above is a cross-section of a door with embedded tapping plate.

Curving

Because of the stiffness of Met-L-Wood, only very slight curvature is possible, particularly with panels having metal on both sides. Simple curvature can be accomplished at the factory by means of special bonding forms.

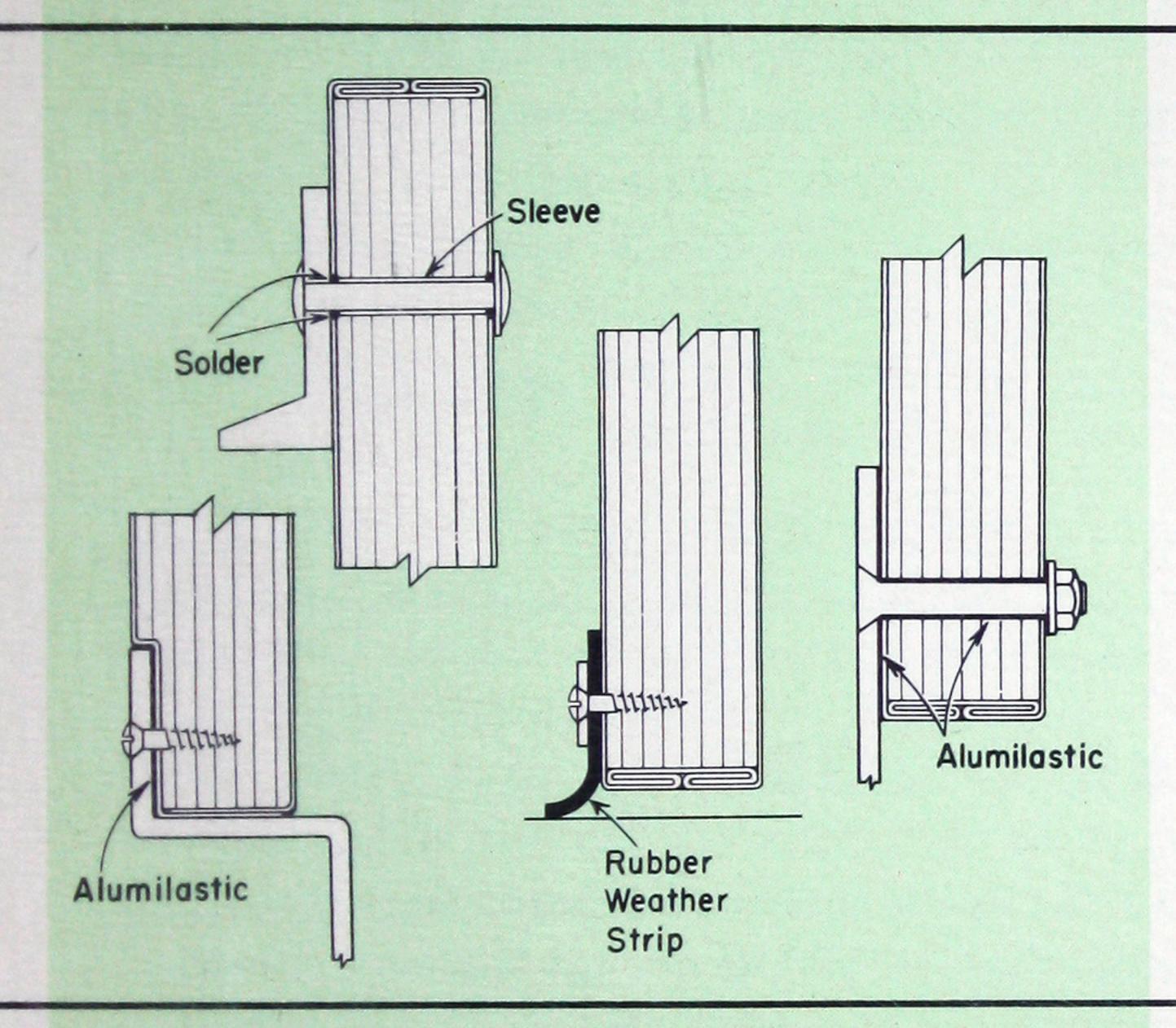
INSTALL MET-L-WOOD



Fasteners for MET-L-WOOD

Sheet metal screws, bolts, machine screws, sleeve nuts, and other generally accepted fasteners can be used effectively on Met-L-Wood. For hinges, locks, hangers, handles and other hardware fittings, tapping plates (as described on the opposite page) usually are desirable to eliminate through fasteners and to add strength.

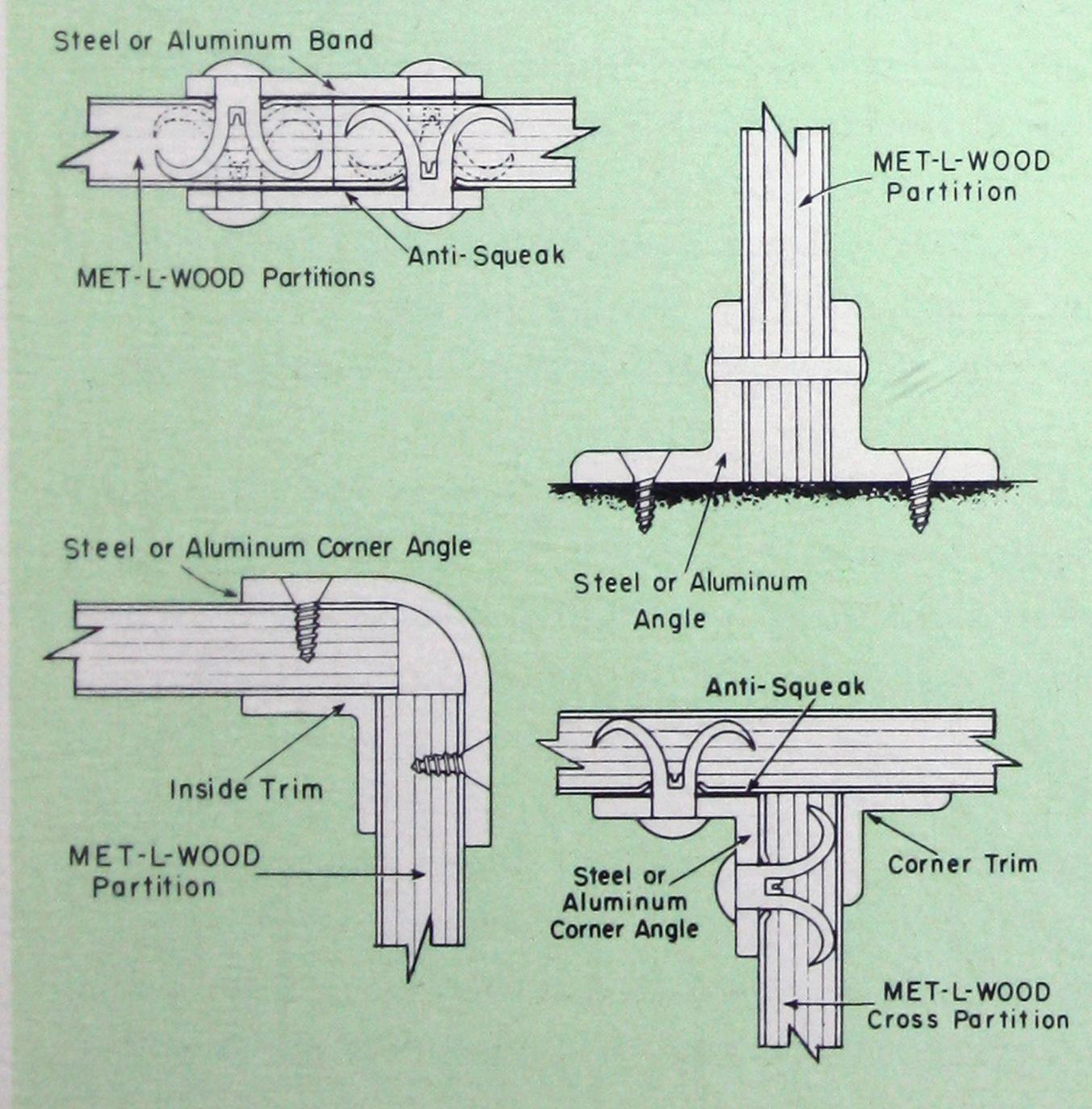
A fast, simple and reliable method for ordinary fastening is found in the use of specially developed Met-L-Wood Split Rivets. To apply these, only a hammer, bucking bar and grooved punch are needed. The split rivet penetrates one metal surface of the Met-L-Wood and, without piercing the opposite surface, spreads and forms an anchor. The cross-section illustration at left shows the secure fastenings formed by the split rivet.



Sealing Fastenings for Waterproofness

When through-bolt fastenings are necessary, it is recommended that holes be made at the factory with metal sleeves soldered in the holes to maintain waterproofness. If holes must be drilled in the field, a good sealing compound (such as Alumilastic) should be used. It should be applied inside the hole liberally enough so that squeeze-out is evident when the fastener is drawn up tight.

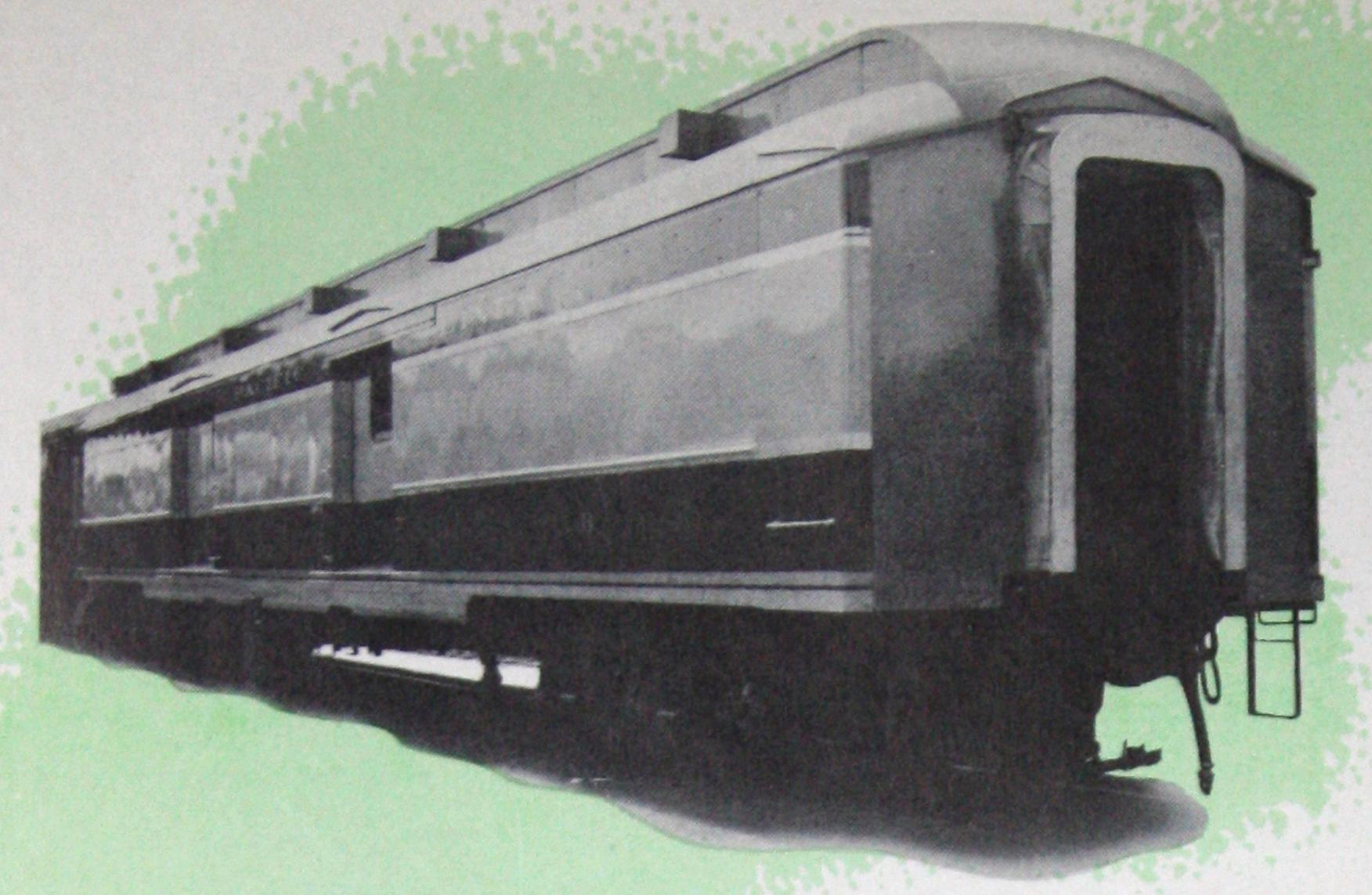
The soldered-sleeve hole, together with three typical methods of sealing fastenings to Met-L-Wood, are illustrated at left.



Joining Techniques

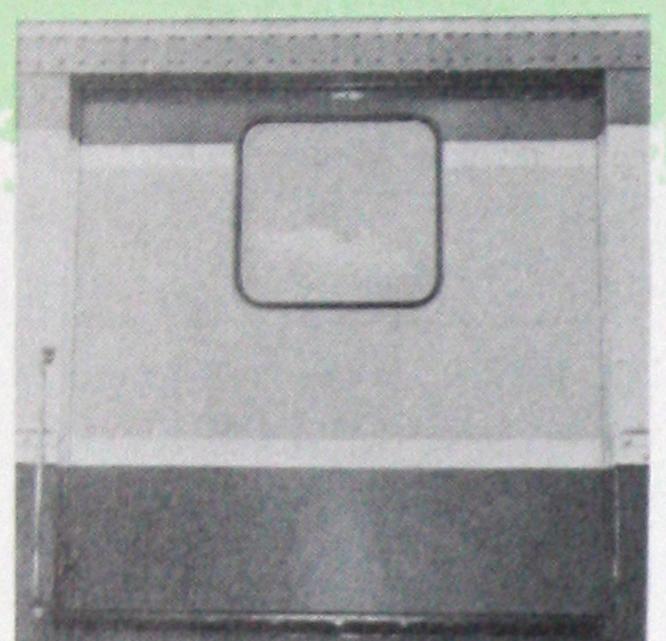
Joining Met-L-Wood at corner, floor and ceiling junctions and when panels are placed side by side, can be accomplished with speed and simplicity.

For side by side installation, the method illustrated at left (above) is recommended. It employs steel or aluminum strips on both sides of the joint, with split rivets (or other fasteners) applied alternately on the two sides. Steel or aluminum angles are used in the other methods illustrated, with split rivets, screws, through-bolts, or other fasteners used, as needed.



BAGGAGE AND POSTAL CAR DOORS

Met-L-Wood baggage and postal car doors have many important advantages over conventional construction of wood or steel:



No through bolts, screws or rivets.

Completely weatherproof edge and surface seals, make internal rust or rot impossible—adds years to useful door life.

Light weight for easier opening and closing—less overall car weight.

Stainless steel channels along bottom edges of sliding doors are rustproof, virtually wearproof.

All-rubber window sash can be

installed or removed in minutes. Will not allow glass to rattle—absolutely water- and weatherproof. For details, see page 7.

Types and sizes available to meet all requirements: end and side doors, single or split, sliding or hinged. Heights and widths to railroad specifications. Standard thickness, one inch; other thicknesses made to order.



PASSENGER CAR DOORS

End and Vestibule Doors—Met-L-Wood's sound-deadening properties, light weight, and strength combine to make it the ideal door material.

End doors for passenger cars are fabricated of Met-L-Wood for manual or automatic operation, with or without window openings, with or without complete hardware. Dimensions to fit any size opening, with standard thicknesses of $\frac{3}{4}$ " and 1".

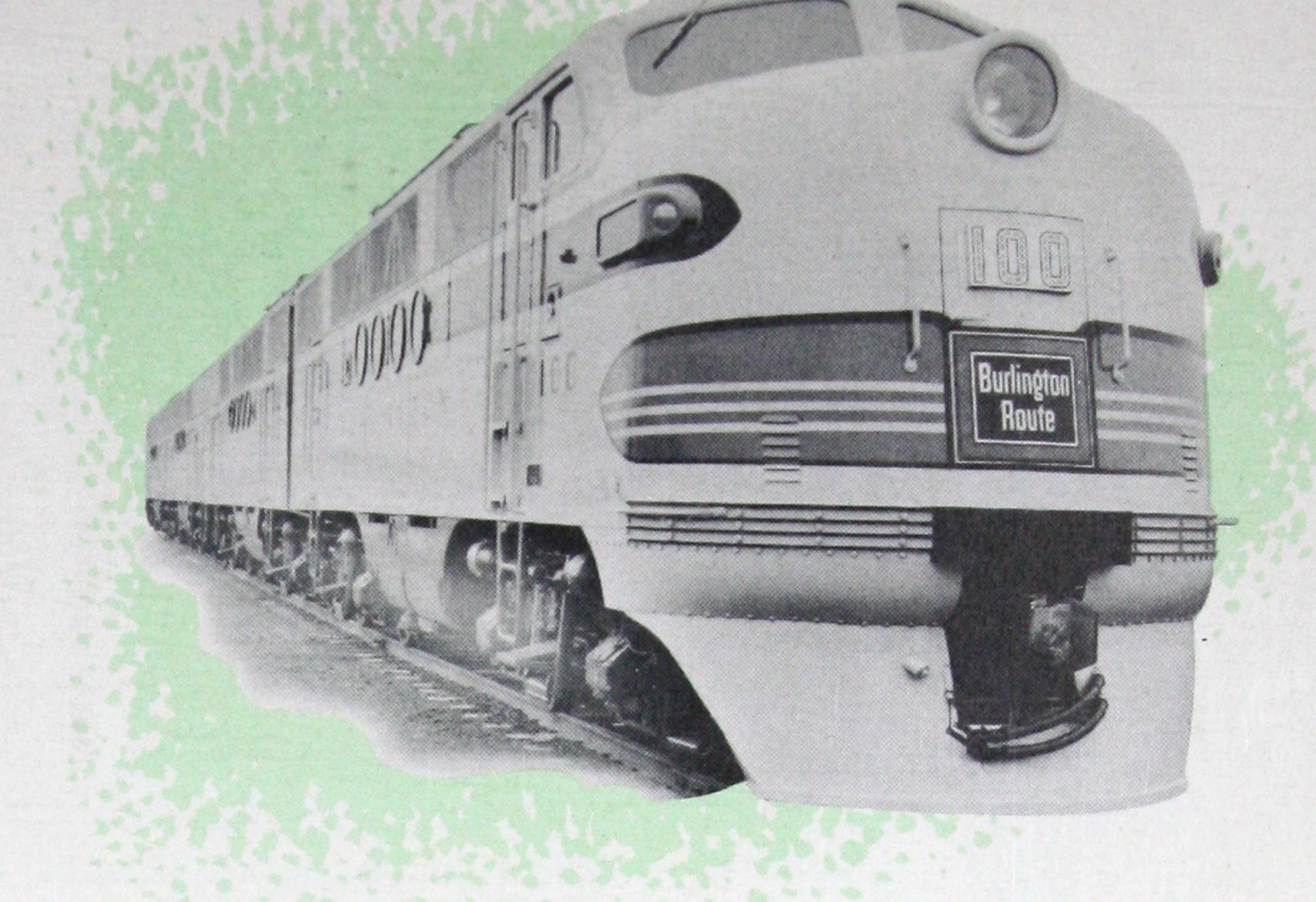
Met-L-Wood vestibule doors are available in full length or dutch types, with or without window openings. Sealed positively against warping, swelling, and internal rust or rot. Standard thickness is 1"; other thicknesses made to order.

Window openings on Met-L-Wood doors are designed for the all-rubber "zipper" sash, which requires no screws or other fastening to set the glass solidly into place. Tapping plates are built into Met-L-Wood doors, forming strong, durable, yet invisible supports for hinges and other hardware. Interior Partition Doors—Met-L-Wood partition doors are available in sizes to fit all plans. Standard thickness is ½"; other thicknesses made to order. Surface hardware generally is used on these doors, but if desired, provisions for internal hardware can be made. The smooth, neat appearance of these doors, plus the easy, quiet operation, mean passenger satisfaction and comfort. The light weight and exact dimensions make installation quick and simple.

THE RAILROADS

DIESEL LOCOMOTIVE SIDE PANELS

Every year America's leading railroads order exterior sheathing of Met-L-Wood for hundreds of their diesel road locomotives. The great strength of Met-L-Wood gives these locomotives durability and safety. Its exceptional lightness provides economy of weight, ease of assembly and helps lower the center of gravity. It insulates, deadens sound, damps vibration, resists fire, will not buckle or warp.



Met-L-Wood's smooth, mar-resistant surfaces are easy to finish and to keep clean, they keep their new look for years.

When ordering Met-L-Wood side panels for your diesel locomotives, the only information required is the locomotive builder's part number.

CABOOSES

Probably no railroad car doors get harder use or more severe weathering than caboose doors . . . and this is the best reason for installing Met-L-Wood doors in all cabooses, old or new, end doors and interior doors.

Met-L-Wood doors are neat, rigid, built to last the life of the caboose. Sealed permanently against the weather, they will not warp or swell; no moisture can penetrate the interior to cause rust or rot.

Round or rectangular window openings can be provided with all-rubber, weathertight, stationary sash, or with provisions for standard drop-sash.

Surface hardware is recommended for Met-L-Wood caboose doors. Doors can be supplied with complete hardware, ready to hang; or without hardware, but with tapping plates as required for on-the-job assembly.

Sizes to meet exact opening dimensions. Standard thicknesses are $\frac{3}{4}$ " or 1"; other thicknesses, if required.



OTHER USES OF MET-L-WOOD BY RAILROADS

DIESEL LOCOMOTIVE DOORS

Met-L-Wood interior and end doors for diesel locomotives, and cab doors for switchers are available in sizes to fit all openings. Window openings are optional, and are designed for all-rubber "zipper" sash in round or rectangular shape. Standard thicknesses, 3/4" and 1"; other thicknesses, to order. Furnished complete with hardware, or with tapping plates for hardware assembly on the job.

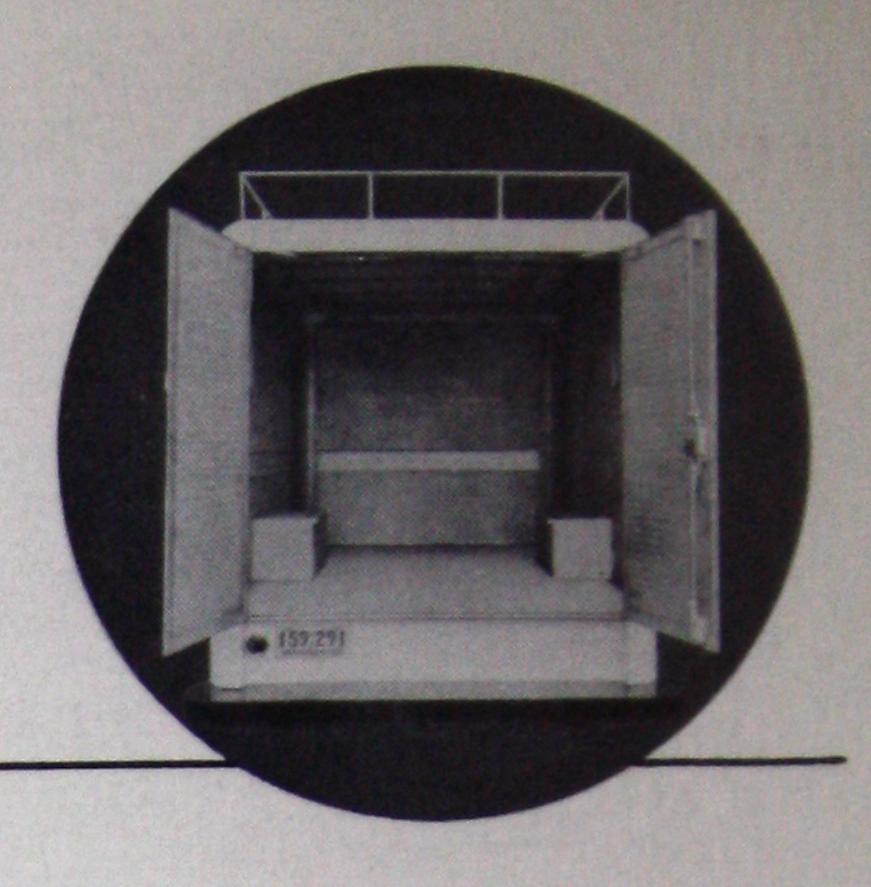
PASSENGER CAR INTERIORS

Interior panels, bulkheads, heading, wainscoting, luggage shelves, cabinets and table tops are a few of the applications where Met-L-Wood permanently beautifies passenger cars. Fast assembly without special tools saves labor costs . . . eliminates framing.

TICKET OFFICES and TERMINALS

For functional beauty and real practicality, Met-L-Wood is an ideal material for building counters, table tops, doors and other parts of city ticket offices, terminals and public rooms. Its attractive finish is easy to keep clean, withstands heavy traffic.

201655 Truck Bodies by MET-L-WOOD



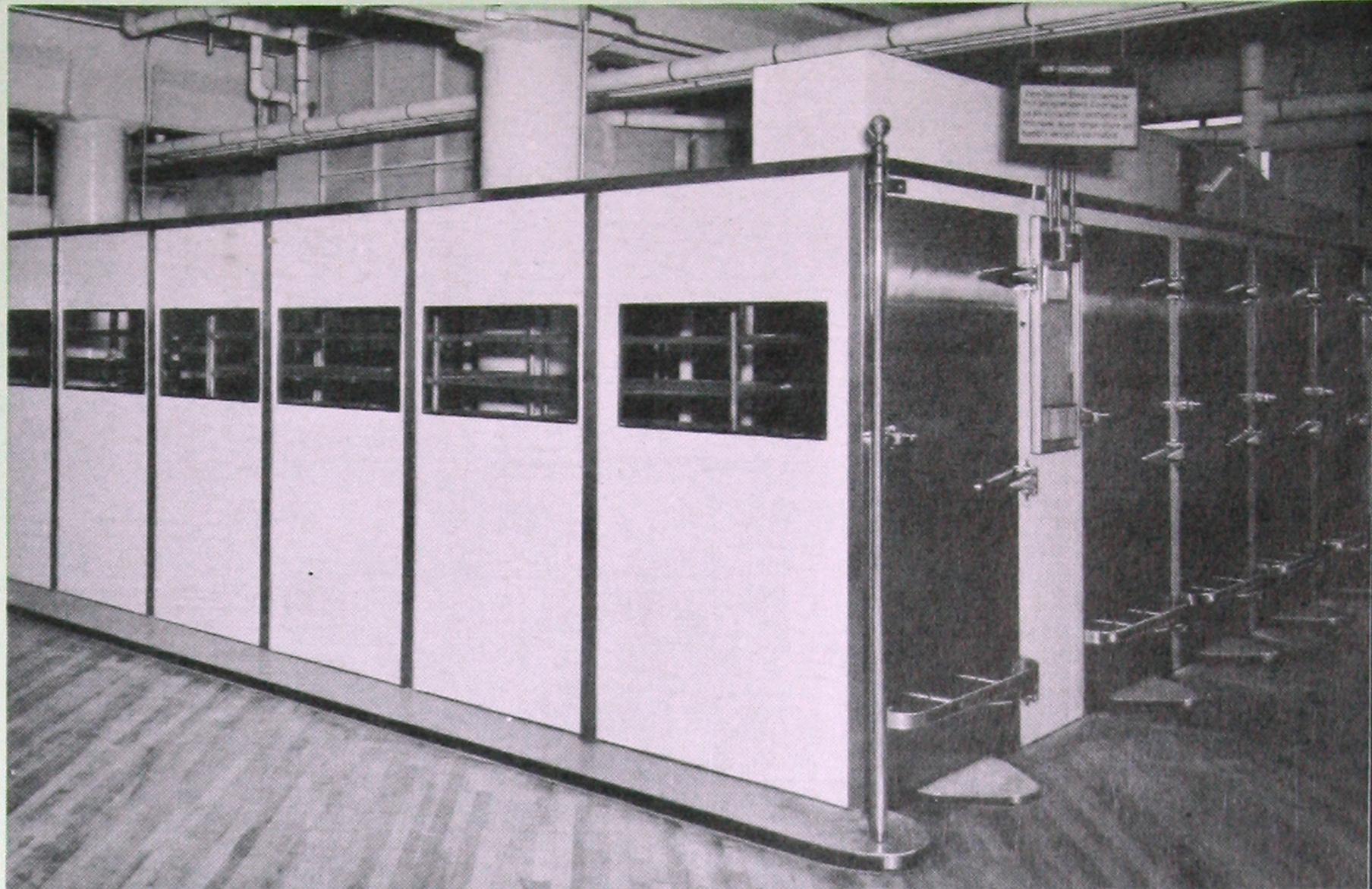
Development of *Ribless* truck bodies by Met-L-Wood has made possible a virtually perfect solution to truckers' problems of weight and payload space. Thin, strong Met-L-Wood panels form body sides, doors and tops. They are joined together with special structural members which eliminate all rib braces, and provide strong, rigid, dust-proof, shake-proof bodies with absolute maximum payload space for any given outside dimensions.

Both Met-L-Wood Ribless one-unit and two-unit bodies lower gravity centers by minimizing dead weight. And ruggedness of construction has frequently resulted in maintenance-free use on hundreds of thousands of miles of hard wear.

Met-L-Wood Ribless Bodies are manufactured by licensed truck body builders to exact specifications. Write Met-L-Wood for the name and address of the Ribless Body builder nearest you.







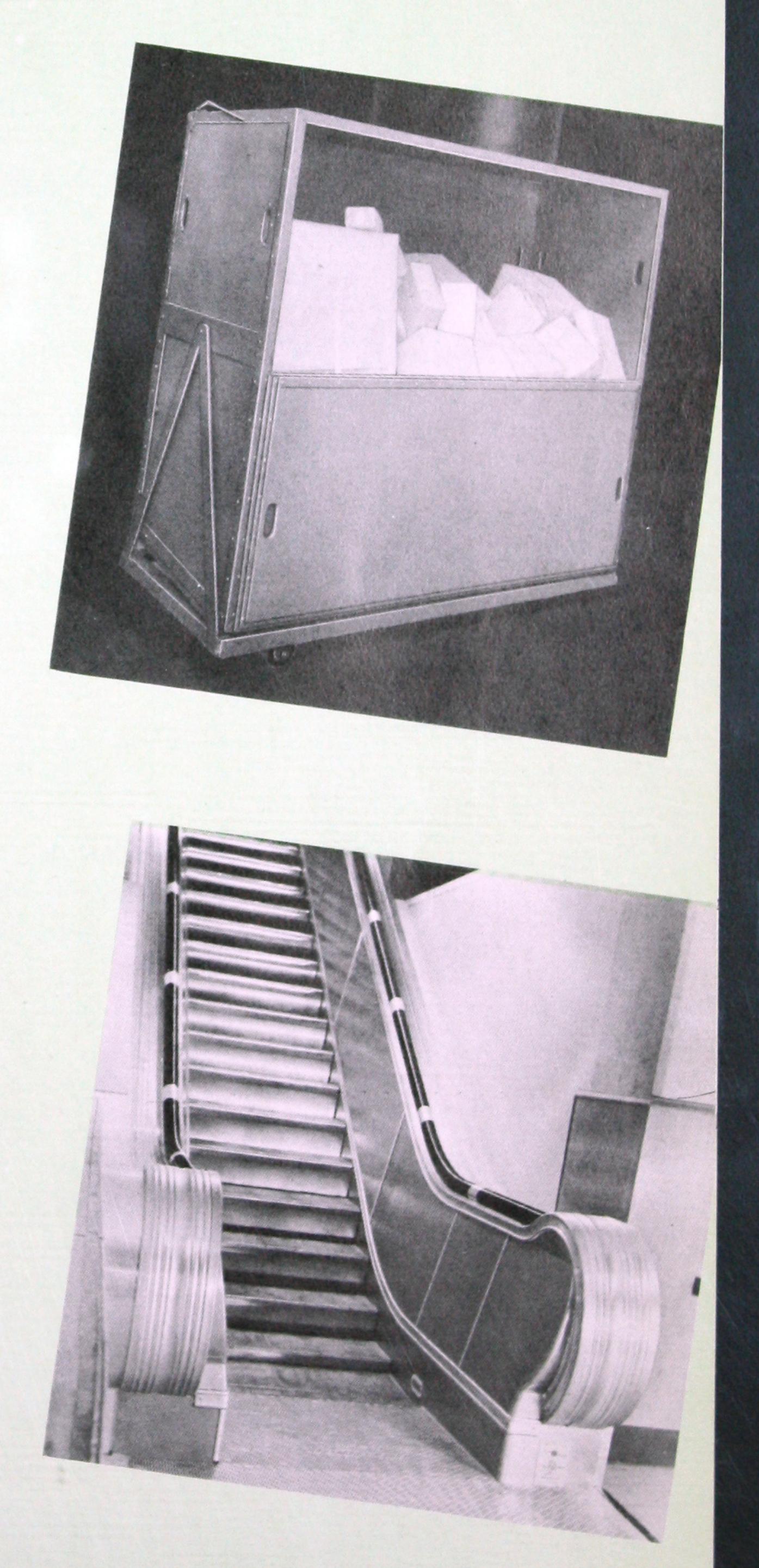
MET-L-WOOD in Architecture and Equipment

X-ray panels and doors—Special lead-lined or lead-surfaced Met-L-Wood panels are available for constructing rooms for X-ray machines and for doors on these rooms. Usually these are made up of a sheet of lead, to each side of which is bonded a sheet of poplar or gum plywood. Or the lead sheet can be bonded to either outside surface of a plywood sheet. If necessary, for extraordinary radiation conditions, two sheets of lead can be used, one bonded to each surface of a core of plywood. These panels provide ease and economy of construction, light weight (especially important in doors), and reliable shielding from harmful rays.

Store Fronts, Bars and Restaurants—Store fronts and marquees fabricated of Met-L-Wood panels have a modern, clean appearance that stays "new looking" for many years. In bars, Met-L-Wood can be used for handsome, rugged counters and panels, and for decorative back-of-the-bar installations. In restaurants and soda fountains, Met-L-Wood panels make attractive wainscoting, tables, counters, shelves and cabinets that are both durable and sanitary.

Offices and Commercial Installations—Prefabricated to specifications or supplied as standard panels, light, strong Met-L-Wood is ideal for partitions, elevator cabs, escalator side panels, truck platforms, ramps and other heavy traffic installations.

Industrial and Commercial Equipment—Quick-freeze cabinets and tunnels, bakery-proof boxes and coolers, gas-tight doors, quarantine cabinets, storage equipment, hand trucks, doors and panels for public conveyances, truck and trailer panels and doors—on these and many other types of equipment, Met-L-Wood gives unusual strength and utility; and its light weight and ease-of-handling qualities make for unique assembly economies.



Specialized Engineering Service for Users of MET-L-WOOD

Your application or fabrication of Met-L-Wood may be a conventional one or it may be entirely new. In either case, the highly skilled engineering staff and production craftsmen of the Met-L-Wood Corporation can help you analyze your requirements and aid you in determining your most profitable uses of Met-L-Wood.

This engineering and production assistance is available at all times.

MET-L-WOOD CORPORATION 6755 West 65th Street • Chicago 38, Illinois [BLANK PAGE]



